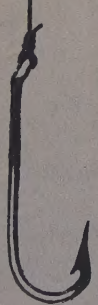
INVESTIGATIONS IN FISH CONTROL

82. *Investigations in Fish Control:*
Index to Numbers 1-72, 1964-76

LIBRARY
JAN 9 1978
FISH & WILDLIFE SERVICE



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Investigations in Fish Control, published by the Fish and Wildlife Service, include reports on the results of work at the Service's Fish Control Laboratories at La Crosse, Wis., and Warm Springs, Ga., and reports of other studies related to that work. Though each report is regarded as a separate publication, several may be issued under a single cover, for economy. [See Investigations in Fish Control 47-50 (in one cover) for list of issues published prior to 1970.]

(Reports 41 through 43 are in one cover.)

41. Identification of MS-222 Residues in Selected Fish Tissues by Thin Layer Chromatography, by John L. Allen, Charles W. Luhning, and Paul D. Harman. 1970. 7 pp.
42. Dynamics of MS-222 in the Blood and Brain of Freshwater Fishes During Anesthesia, by Joseph B. Hunn. 1970. 8 pp.
43. Effect of MS-222 on Electrolyte and Water Content in the Brain of Rainbow Trout, by Wayne A. Willford. 1970. 7 pp.
44. A Review of Literature on TFM (3-trifluormethyl-4-nitrophenol) as a Lamprey Larvicide, by Rosalie A. Schnick. 1972. 31 pp.

(Reports 45 and 46 are in one cover.)

45. Residues of MS-222 in Northern Pike, Muskellunge, and Walleye, by John L. Allen, Charles W. Luhning, and Paul D. Harman. 1972. 8 pp.
46. Methods of Estimating the Half-Life of Biological Activity of Toxic Chemicals in Water, by Leif L. Marking. 1972. 9 pp.

(Reports 47 through 50 are in one cover.)

47. Preparation and Properties of Quinaldine Sulfate, an Improved Fish Anesthetic, by John L. Allen and Joe B. Sills. 1973. 7 pp.
48. Toxicity of Quinaldine Sulfate to Fish, by Leif L. Marking and Verdel K. Dawson. 1973. 8 pp.
49. The Efficacy of a Quinaldine Sulfate as an Anesthetic for Freshwater Fish, by Philip A. Gilderhus, Bernard L. Berger, Joe B. Sills, and Paul D. Harman. 1973. 9 pp.
50. Residue of Quinaldine in Ten Species of Fish Following Anesthesia with Quinaldine Sulfate, by Joe B. Sills, John L. Allen, Paul D. Harman, and Charles W. Luhning. 1973. 9 pp.

(Reports 51 and 52 are in one cover.)

51. Methods for Simultaneous Determination and Identification of MS-222 and Metabolites in Fish Tissues, by Charles W. Luhning. 1973. 10 pp.
52. Residues of MS-222, Benzocaine, and Their Metabolites in Striped Bass Following Anesthesia, by Charles W. Luhning. 1973. 11 pp.

(Reports 53 through 55 are in one cover.)

53. Toxicity of Mixtures of Quinaldine Sulfate and MS-222 to Fish, by Verdel K. Dawson and Leif L. Marking. 1973. 11 pp.
54. The Efficacy of Quinaldine Sulfate:MS-222 Mixtures for the Anesthetization of Freshwater Fish, by Philip A. Gilderhus, Bernard L. Berger, Joe B. Sills, and Paul D. Harman. 1973. 9 pp.
55. Residues of Quinaldine and MS-222 in Fish Following Anesthesia with Mixtures of Quinaldine Sulfate:MS-222, by Joe B. Sills, John L. Allen, Paul D. Harman, and Charles W. Luhning. 1973. 12 pp.

(Reports 56 through 59 are in one cover.)

56. Toxicity of the Lampricide 3-Trifluoromethyl-4-nitrophenol (TFM) to 10 Species of Algae, by A. A. Maki, L. D. Geissel, and H. E. Johnson. 1975. 17 pp.
57. Acute Toxicities of 3-Trifluoromethyl-4-nitrophenol (TFM) and 2',5-Dichloro-4'-nitrosalicylanilide (Bayer 73) to Larvae of the Midge *Chironomus tentans*, by J. A. Kawatski, M. M. Ledvina, and C. R. Hansen. 1975. 7 pp.
58. Acute Toxicity of the Lampricide 3-Trifluoromethyl-4-nitrophenol (TFM) to Nymphs of Mayflies (*Hexagenia* sp.), by C. R. Fremling. 1975. 8 pp.
59. Toxicity and Residue Dynamics of the Lampricide 3-Trifluoromethyl-4-nitrophenol (TFM) in Aquatic Invertebrates, by H. O. Sanders and D. F. Walsh. 1975. 9 pp.

Use of trade names does not imply U.S. Government endorsement of commercial products.

INVESTIGATIONS IN FISH CONTROL

82. *Investigations in Fish Control:* Index to Numbers 1-72, 1964-76

By Rosalie A. Schnick
Kimberlee A. Graves

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Washington, D. C. • 1977

Digitized by the Internet Archive
in 2025

https://archive.org/details/investigations-fish-control_1977_82

Investigations in Fish Control: Index to Numbers 1-72, 1964-76

by

Rosalie A. Schnick and Kimberlee A. Graves

U.S. Fish and Wildlife Service
Fish Control Laboratory, P. O. Box 818
La Crosse, Wisconsin 54601

Abstract

This index comprises key words from *Investigations in Fish Control,* a publication of the U.S. Fish and Wildlife Service that reports results of research conducted at the Fish Control Laboratories, La Crosse, Wisconsin, and Warm Springs, Georgia, and by certain cooperating investigators. Each number constitutes a separate publication, although several may be issued under a single cover. An appendix lists the titles, authors, and publication dates of *Investigations in Fish Control* included in this index.

This index was constructed from key words and related terms from the text of issues 1-72 of *Investigations in Fish Control.* Items indexed include fish and invertebrate species, plants, chemical names, terminology, and author names. For clarity and convenience, "see also" references are included. Common names of species constitute the main entries; scientific names are referenced to common names. All common and scientific names of species in the list have been verified in the following references:

Aquatic plants: macrophytes, Prescott 1969; algae, Smith 1950, and Whitford and Schumacher 1973.

Invertebrates: insects, Borror and White 1970; others, Pennak 1953.

Fish: aquarium fishes, Axelrod and Schultz 1955; North American fishes, Bailey 1970; others, Grzimek 1973 and 1974, and Sterba 1963.

Amphibians and reptiles: Conant 1958; Smith 1961; frogs, Wright and Wright 1949.

Chemical names are referenced to the common or trade names of the chemicals. Chemical nomenclature conforms to the system suggested by the International Union of Pure and Applied Chemists (IUPAC). Entries are listed alphabetically.

Each indexed term is followed by the issue number(s) in which the term appears.

Index

Acara, blue, 16.
Acetanilid, 16. (See also Anesthetics)
Acipenser transmontanus. (See Sturgeon, white)
Acriflavine, 18. (See also Therapeutants)
Acrocheilus alutaceus. (See Chiselmouth)
Additive index, 57, 67, 69.
Adult. (See Life stage, fishes)
Aequidens pulcher. (See Acara, blue)
Aeschna sp. (See Dragonflies)
Alcohol, 16. (See also Anesthetics)
Aldrin, 3, 35. (See also Insecticides, cyclodione)
Alewife, 7.
Algae, 2, 4, 44, 66. (See also Diatoms)
  blue-green, 4, 56, 71.
  dinoflagellate, 4.
  green, 4, 56.
Alkalinity, 2, 3, 13, 19, 27, 44.
Alkaloids, 1. (See also Test chemicals; Plant extracts)
Alkyl dimethylbenzylammonium chlorides. (See Roccal; Hyamine 3500)
Allen, J. L., 41, 45, 47, 50, 55, 65, 66.
Alosa pseudoharengus. (See Alewife)
Alypin, 16. (See also Anesthetics)
Ambloplites rupestris. (See Bass, rock)
Ambystoma.
  maculatum (See Salamander, spotted)
  punctatum (See *Ambystoma maculatum*)
  talpoideum (See Salamander, mole)
  tigrinum (See Salamander, tiger)
Ambystomidae. (See Salamanders)
Ameletus sp. (See Mayflies)
Amia calva. (See Bowfin)
m-Amino ethyl benzoate, 16. (See also Anesthetics)
Amobarbitol sodium, 31. (See also Anesthetics)
Amopyroquin dihydrochloride, 18. (See also Therapeutants)
Amphibians, 16, 44. (See also Frogs; Salamanders)
Amphipoda. (See Scuds; Gammarids)
Anabaena sp. (See Algae, blue-green)
Anabaena
  cylindrica (See Algae, blue-green)
  flos-aquae (See Algae, blue-green)
Analytical methodology, 14, 31, 41, 44, 45, 46, 51.
Anatinae. (See Ducks, surface feeding)
Anax sp. (See Dragonflies)
Anchoveta, 31.
Anchovies, 40.
Anesthetics, 1, 12, 13, 14, 15, 16, 17, 22, 23, 24, 29, 30, 31, 42, 43, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 71. (See also Test chemicals; Sedatives)
Anguilla vulgaris. (See Eel)
Anileridine, 71. (See also Anesthetics; Fish collecting aids)
Anisoptera. (See Dragonflies)
Annelida. (See Earthworms, aquatic; Leeches)
Anodonta sp. (See Mussels)
Anopheles sp. (See Mosquitoes)
Antagonism, 67. (See also Synergism)
Antibiotics, 1. (See also Test chemicals; Therapeutants)
Antimycin, 2, 9, 20, 25, 26, 27, 28, 35, 38, 39, 40, 46, 57, 67, 68, 71. (See also Piscicides; Chemical mixtures)
Antiseptics, 1. (See also Test chemicals, Therapeutants)
Aphanizomenon sp. (See Algae)
Apiocystis sp. (See Algae)
Aplodinotus grunniens. (See Drum, freshwater)
Apparatus
  labor-saving, 21.
  recycling test, 58.
Aqualin, 34, 71. (See also Fish collecting aids)
Aquatic insects. (See Insects, aquatic)
Aquatic invertebrates. (See Invertebrates)
Aquatic macrophytes. (See Plants, aquatic)
Aquatic plants. (See Plants, aquatic)
Aquatic sowbug. (See Sowbug, aquatic)
Ardeidae. (See Herons)
Arius felis. (See Catfish, sea)
Arrowhead, 2, 3. (See also Plants, aquatic)
Ascomorpha sp. (See Rotifers)
Asellus brevicaudus. (See Sowbug, aquatic)
Asplanchna sp. (See Rotifers)
Asterionella sp. (See Diatoms)
Atabrine. (See Quinacrine hydrochloride)
Attractants, 1. (See also Test chemicals)
Australorbis glabratus. (See Snails)
Aythyinae. (See Ducks, diving)
4'-Azophenyl-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)

Back swimmers, 2, 4, 27, 44, 62. (See also Invertebrates)
Bacteria, 44. (See also Degradation)
Bacterial diseases. (See Diseases, bacterial)
Bactericides, 1, 18. (See also Therapeutants; Test chemicals)
Balistes capriscus. (See Triggerfish, gray)
Barb, blackspot, 16.
Barokain, 16. (See also Anesthetics)
Bass (Centrarchidae)
  largemouth, 1, 2, 6, 10, 11, 12, 16, 19, 22, 23, 26, 27, 28, 30, 31, 32, 33, 38, 40, 41, 44, 48, 49, 50, 51, 52, 53, 54, 55, 60, 65, 67, 68, 71, 72.
  rock, 1, 2, 7, 27, 38, 40, 44, 71.
  smallmouth, 1, 10, 16, 19, 22, 26, 27, 32, 33, 35, 38, 40, 44, 60, 72.

Bass (Percichthyidae)
striped, 51, 52, 55.
white, 11, 27, 40, 42, 65.
Bass (Serranidae)
kelp, 16, 31.
Bayer 73, 19, 37, 38, 44, 57, 69. (See also Lampricides; Piscicides)
Bayluscide. (See Bayer 73).
Beetles (Coleoptera), 2, 4, 44.
riffle, 44.
Benzanilide, 9.
Benzocaine, 52. (See also Anesthetics)
1,4-Benzoquinone, 56. (See also Herbicides)
Berger, B. L., 2, 26, 27, 40, 49, 54.
Betta splendens. (See Siamese fighting fish)
Bibliographies, 16, 31, 44. (See also Literature reviews)
Bile, 35. (See also Excretion)
Bills, T. D., 61, 69, 72.
Bioassays. (See Toxicity tests)
Biodegradability, 19. (See also Degradation)
Biological activity, 44, 46, 72.
Biomagnification, 59. (See also Residues)
Birds, 40, 44.
Blood
fish, 11.
lactate levels, 16.
mammalian, 11.
protein, 11.
samples, 11, 14, 15, 16, 35, 41, 42, 51.
worms (See Midges)
Bluegill, 1, 2, 3, 10, 12, 16, 18, 19, 20, 22, 23, 25, 26, 27, 28, 30, 31, 32, 33, 34, 37, 38, 40, 41, 42, 44, 48, 49, 50, 51, 52, 53, 54, 55, 60, 61, 65, 67, 68, 69, 71, 72.
Bosmina. (See Water fleas)
Botryococcus. (See Algae)
Bottom
fauna, 2.
poison, 44. (See also Piscicides; Lampricides)
sediment, 44.
soil, 66. (See also Residues)
Bowfin, 2, 26, 27, 38, 39, 40, 42, 68, 72.
Brachionus. (See Rotifers)
Brachydanio rerio. (See Zebra fish)
Brain, 39.
electrolyte, 43. (See also Anesthetics)
samples, 35, 41, 42.
3′-Bromo-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
4′-Bromo-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
4′-Bromo-2′-methyl-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
4′-Bromo-2-nitrobenzanilide, 9. (See also Nitrobenzanilides)
3-Bromo-4-nitrophenol, 44. (See also Lampricides)
2′-Bromo-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
3′-Bromo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
4′-Bromo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
5-Bromo-3-nitrosalicylic acid, 37.
4′-Bromo-3-nitro-o-salicylotoluidide, 9.
Buenoa. (See Back swimmers)
Buffalo
bigmouth, 1, 2, 19, 26, 27, 33, 40.
hybrid, 27, 40.
smallmouth, 27, 32, 40.
Bugs (Hemiptera), 4. (See also Insects, aquatic; Invertebrates)
Bullfrog. (See Frogs)
Bullhead
black, 1, 2, 3, 4, 5, 6, 10, 16, 19, 20, 26, 27, 33, 34, 37, 38, 40, 42, 48, 49, 54, 60, 67, 71, 72.
brown, 1, 2, 3, 7, 11, 16, 19, 26, 27, 28, 32, 33, 38, 39, 40, 71.
yellow, 2, 4, 24, 26, 27, 33, 38, 40, 44, 71.
Bulrush, 4. (See also Plants, aquatic)
Burbot, 7.
Burress, R. M., 21, 25, 28, 68, 71.

Caddis flies, 2, 4, 44, 58. (See also Insects, aquatic; Invertebrates)
Cadmium sulfite, 44. (See also Marking for identification, lamprey)
Caenis. (See Mayflies)
Callibaetis sp. (See Mayflies)
Cambarus sp. (See Crayfishes)
Camplyodiscus. (See Diatoms)
Campostoma anomalum. (See Stoneroller)
Carangidae. (See Jacks or Pompanos)
Caranx hippos. (See Jack, crevalle)
Carassius auratus. (See Goldfish)
Carbamates, 1. (See also Test chemicals)
Carbon dioxide, 16, 31, 44. (See also Anesthetics)
Carcinogens, 16. (See also Urethane)
Carp, 1, 2, 3, 10, 11, 16, 19, 20, 26, 27, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 48, 49, 53, 54, 60, 65, 71, 72.
grass, 26, 40, 49, 54.
Carpiodes cyprinus. (See Quillback)
Carps, 71.
Catenula sp. (See Flatworms)
Catfish, 1.
blue, 27, 40.
channel, 1, 2, 10, 16, 17, 18, 19, 20, 22, 23, 25, 26, 27, 28, 30, 31, 32, 33, 34, 38, 39, 40, 41, 42, 44, 45, 46, 48, 49, 50, 51, 53, 54, 55, 60, 61, 65, 68, 69, 71, 72.
flathead, 19, 26, 27, 40.
sea (*Arius felis*), 26, 40.
white, 26, 27, 33, 40.

Catfishes, 2, 20, 39, 71.
Catostomidae. (See Suckers; Redhorse; Chubsucker)
Catostomus
catostomus. (See Sucker, longnose)
columbianus. (See Sucker, bridgelip)
commersoni. (See Sucker, white)
macrocheilus. (See Sucker, largescale)
Cats, 31.
Cattail, 28. (See also Plants, aquatic)
Centengraulis mysticetus. (See Anchoveta)
Centrarchidae. (See Sunfish; Bass; Crappie)
Ceratium. (See Algae, dinoflagellate)
Ceratophyllum sp. (See Coontail)
Ceriodaphnia sp. (See Water fleas)
Chandler, J. H., Jr., 61, 62.
Channa argus. (See Snakehead fish)
Chaoborus. (See Midges, phantom)
Chara sp. (See Plants, aquatic)
Chelating agent, 44.
Chelydra serpentina. (See Turtle, common snapping)
Chelydridae. (See Turtles)
Chemical
characterization, 2, 26, 40, 47.
concentrations, 68.
mixtures, 44, 53, 54, 55, 57, 67, 69.
oxygen demand, 44.
properties, 44, 47.
structure, 9.
Chilodenella, 18. (See also Diseases, parasitic)
Chironomids. (See Midges)
Chironomus tentans. (See Midges)
Chiselmouth, 40.
Chloral hydrate, 16, 31. (See also Anesthetics)
Chlordane, 3. (See also Insecticides, cyclodione)
Chlorella pyrenoidosa. (See Algae, green)
Chloretone, 16, 31. (See also Anesthetics)
Chlorine, 40, 72. (See also Detoxification; Piscicides)
3′-Chloro-5-acetamidosalicylanilide, 9.
p-Chlorobenzanilide, 9.
4′-Chloro-5-bromo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
4′-Chloro-2′,5′-dimethoxy-3-nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
2′-Chloro-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
3′-Chloro-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
5′-Chloro-3,5-dinitro-*o*-benzanisidide, 9.
3′-Chloro-3,5-dinitro-*o*-benzotoluidide, 9.
5′-Chloro-3,5-dinitro-*o*-benzotoluidide, 9.
3′-Chloro-3,5-dinitro-*p*-benzotoluidide, 9.
2′-Chloro-3,4′-dinitrosalicylanilide, 9. (See also Nitrosalicylanilides)
3′-Chloro-3-hydroxybenzanilide, 9.
4′-Chloro-3-hydroxybenzanilide, 9.
3-Chloro-7-methoxy-9-(1-methyl-4-diethylaminobutylamino) acridine dihydrochloride. (See Quinacrine hydrochloride)
5′-Chloro-2′-methoxy-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
2′-Chloro-4′-methyl-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
4′-Chloro-2′-methyl-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
2′-Chloro-2-nitrobenzanilide, 9. (See also Nitrobenzanilides)
2′-Chloro-3-nitrobenzanilide, 9. (See also Nitrobenzanilides)
2′-Chloro-4-nitrobenzanilide, 9. (See also Nitrobenzanilides)
3′-Chloro-2-nitrobenzanilide, 9. (See also Nitrobenzanilides)
3-Chloro-3-nitrobenzanilide, 9, 37. (See also Nitrobenzanilides)
3′-Chloro-4-nitrobenzanilide, 9. (See also Nitrobenzanilides)
4′-Chloro-2-nitrobenzanilide, 9. (See also Nitrobenzanilides)
5′-Chloro-4-nitrobenzanilide, 9. (See also Nitrobenzanilides)
3′-Chloro-2-nitro-*o*-benzotoluidide, 9.
3′-Chloro-3-nitro-*p*-benzotoluidide, 9.
2′-Chloro-4-nitro-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
2′-Chloro-5-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
3′-Chloro-3-nitrosalicylanilide, 9. (See also Nitrosalicylanilides; 33NCS)
3′-Chloro-5-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
4′-Chloro-3-nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
4′-Chloro-5-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
5′-Chloro-3-nitro-*o*-salicylanisidide, 9.
3′-Chloro-3-nitro-*o*-salicylotoluidide, 9.
4′-Chloro-3-nitro-*o*-salicylotoluidide, 9.
6′-Chloro-3-nitro-*o*-salicylotoluidide, 9.
2′-Chloro-3-nitro-*p*-salicylotoluidide, 9.
4-(7-Chloro-4-quinolylamino)-α-1-pyrrolidyl-*o*-cresol dihydrochloride. (See Amopyroquin dihydrochloride)
2′-Chloro-5′-trifluoromethyl-3-nitrosalicylanilide, 37. (See Nitrosalicylanilides)
Chlorobutanol, 16, 31. (See Anesthetics)
Chlorophyta. (See Algae, green)
Chodatella. (See Algae, green)
Chromogaster. (See Rotifers)
Chrysemys picta. (See Turtle, painted)
Chrysophyta. (See Diatoms)

Chrysops. (See Horseflies)
Chub
  creek, 27, 35, 40.
  lake, 38.
  northern creek. (See Chub, creek)
Chubsucker, lake, 71.
Chydorus. (See Water fleas)
Cladocera. (See Water fleas)
Cladophora sp. (See Algae, green)
Clams. (See Mussels)
Closteriopsis. (See Algae, green)
Closterium. (See Algae, green)
Clupea harengus harengus. (See Herring, Atlantic)
Clupeidae. (See Herrings)
Cocaine, 16. (See also Anesthetics)
Coelastrium. (See Algae, green)
Coelenterata. (See Hydras)
Coelosphaerium. (See Algae, blue-green)
Coleoptera. (See Beetles)
Collecting aids. (See Fish collecting aids)
Colorimetric method, 14, 15, 16, 33, 35, 44, 45, 51, 52, 55. (See also Analytical methodology)
Colubridae. (See Snakes)
Combination. (See Chemical mixtures)
Concentrations. (See Chemical concentrations)
Conductivity, 11, 44, 71.
Conochiloides. (See Rotifers)
Control, fish. (See Fish control; Piscicides)
Control, sea lamprey. (See Lampricides)
Coontail, 4. (See also Plants, aquatic)
Copelatus. (See Beetles)
Copepoda. (See Copepods)
Copepods, 4, 27. (See also Invertebrates)
Copper, 67. (See also Chemical mixtures)
CoRal, 18. (See also Therapeutants)
Coregonus oregonius. (See Jack, chiselmouth; Whitefish, mountain)
Corixidae. (See Water boatmen)
Corydoras paleatus. (See Catfish)
Costia. (See Diseases, parasitic)
Cottus sp. (See Sculpin sp.)
  aleuticus. (See Sculpin, coastrange)
  asper. (See Sculpin, prickly)
  bairdi. (See Sculpin, mottled)
  perplexus. (See Sculpin, reticulate)
  rhotheus. (See Sculpin, torrent)
Couesius plumbeus. (See Chub, lake)
Cows, 44.
Crane flies, 66. (See also Invertebrates; Insects, aquatic)
Crappie
  black, 2, 3, 4, 26, 27, 40, 71.
  white, 1, 2, 3, 4, 24, 26, 27, 28, 33, 40, 71.
Crayfishes, 2, 27, 38, 44, 58, 59, 66. (See also Invertebrates)
Cresol, 16, 34, 71. (See also Fish collecting aids; Anesthetics)
Crucigenia. (See Algae, green)
Crustaceans, 59. (See also Invertebrates; Crayfishes)
Ctenopharyngodon idella. (See Carp, grass)
Culaea inconstans. (See Stickleback, brook)
Culex sp. (See Mosquitoes)
Cumming, K. B., 63. 71.
Cyanide, 67. (See also Chemical mixtures)
Cyanophyta. (See Algae, blue-green)
Cyclodione insecticides. (See Insecticides, cyclodione)
Cyclops. (See Copepods)
Cylindrospermum sp. (See Algae, blue-green)
Cymatopleura. (See Diatoms)
Cymbella. (See Diatoms)
Cypridopsis sp. (See Shrimp, seed)
Cyprinidae. (See Minnows; Carps; Shiners)
Cyprinodon variegatus. (See Minnow, sheepshead)
Cyprinus carpio. (See Carp)

Dace
  blacknose, 27, 40.
  longnose, 27, 38, 40.
  northern redbelly, 10, 26, 40.
  southern redbelly, 40.
Damselflies, 1, 2, 4, 27, 35, 44, 59, 66. (See also Invertebrates; Insects, aquatic)
Daphnia sp. (See Water fleas)
Daphnia magna. (See Water fleas)
Daphnid. (See Water fleas)
Darter
  fantail, 27, 40.
  Iowa, 2, 26, 27, 40.
  johnny, 27, 40.
Dasyatidae. (See Stingrays)
Dawson, V. K., 48, 53, 63, 67.
p-,*p*'DDT, 1, 6, 9, 10, 19, 20.
Deactivation, 1, 46. (See also Degradation; Detoxification)
Deactivation index, 60. (See also Degradation; Detoxification)
Deactivators, 1. (See also Test chemicals)
Decapoda. (See Crayfishes; Shrimps)
Deer, white-tailed, 44.
Degradation, 2, 3, 17, 25, 26, 27, 35, 44, 46, 71. (See also Detoxification; Bacteria)
Delnav, 67. (See also Chemical mixtures)
Desmidium. (See Algae, green)
Detoxification, 1, 2, 3, 8, 19, 25, 26, 27, 40, 46, 60, 72. (See also Degradation)
Developmental stage. (See Life stage, fishes)
3,6-Diamino-10-methyl acridinium chloride and 3,6-diaminoacridine. (See Acriflavine)
Diaptomus. (See Copepods)
Diatoma. (See Diatoms)

Diatoms, 4, 56. (See also Algae)
Dibenzlene, 44. (See also TFM)
Dibrom, 67. (See also Chemical mixtures)
2',5'-Dibromo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
4',5'-Dibromo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
2,5-Dichloro-4-nitrophenol, 44. (See also Lampricides)
2',5-Dichloro-4'-nitrosalicylanilide. (See Bayer 73; See also Nitrosalicylanilides)
3',4'-Dichloro-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
5,2'-Dichloro-4-nitrosalicylanilide. (See Bayer 73)
Dieldrin, 3, 35. (See also Insecticides, cyclodione)
Diethyl ether, 31. (See also Anesthetics)
0,0-Diethyl 0-3-chloro-4-methyl-2-oxo-2H-1-benzopryan-7-yl-phosphorothioate. (See CoRal)
2',5'-Diethyl-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
2',6'-Diethyl-3,5-dinitrobenzanilide, 37. (See also Nitrobenzanilides)
Digestion rates, fish, 33. (See also Voidance time)
Dilution, 3. (See also Detoxification)
2',5'-Dimethoxy-4'-chloro-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
3,7-*bis*(Dimethylamino)phenazathionium chloride. (See Methylene blue)
bis(*p*-Dimethylaminophenyl)phenylmethane. (See Malachite green)
N,N-Dimethylformamide. (See DMF)
N'-(3,4-Dimethyl-5-isoxazolyl)sulfanilamide. (See Sulfisoxazole)
0,0-Dimethyl 0-[4-(methylthio)-*m*-tolyl] phosphorothioate. (See Tiguvon)
2',4'-Dimethyl-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
N'-(4,6-Dimethyl-2-pyrimidinyl)sulfanilamide. (See Sulfamethazine)
Dimethyl sulfoxide, 20.
0,0-Dimethyl 2,2,2-trichloro-1-hydroxyethyl phosphonate. (See Neguvon)
0,0-Dimethyl 0-2,4,5-trichlorophenyl phosphorothioate. (See Trolene)
3,5-Dinitrobenzanilide, 9. (See also Nitrobenzanilides)
3,5-Dinitro-*o*-benzotoluidide, 9.
3,5-Dinitro-2',3'-benzoxylidide, 9.
2',3-Dinitro-*m*-salicylanisidide, 9.
3',5'-Dinitro-*o*-salicylotoluidide, 9.
2',3-Dinitro-*p*-salicylotoluidide, 9.
Dinobryon. (See Diatoms)
Diptera. (See Flies; Mosquitoes; Midges)
Diquat, 56. (See also Herbicides)
Disinfectants, 18, 32.
Diseases
  bacterial, 12, 18.
  kidney, 18.
  parasitic, 18.
Dissipation, 50, 59. (See also Residues; Degradation)
Dissolved oxygen, 6. (See also Water quality)
DMF, 60. (See also TFM)
DMSO. (See Dimethyl sulfoxide)
Dobsonflies, 66. (See also Invertebrates; Insects, aquatic)
Dog, 19, 31.
Dogfish, spiny, 42, 52.
Dolly varden, 8, 16, 40.
Dorosoma cepedianum. (See Shad, gizzard)
  petenense. (See Shad, threadfin)
Dose-effect curve, 36.
Dragonflies, 2, 4, 38, 44, 58, 66. (See also Invertebrates; Insects, aquatic)
Dredge, anchor, 44.
Drum, freshwater, 1, 2, 10, 26, 27, 40.
Ducks, diving, 27.
Ducks, surface feeding, 27.
Duckweeds, 71. (See also Plants, aquatic)
Dyes, 27, 33, 67.
Dytiscus. (See Beetles)

Earthworms, aquatic, 2, 4, 8, 27, 44, 62, 66. (See also Invertebrates)
Eel, 39.
  Gymnotid, 47.
Effective contact time (ECT), 26.
Efficacy, 13, 16, 17, 19, 22, 25, 27, 30, 31, 34, 44, 46, 49, 54, 63, 67, 71.
Egg. (See Life stage, fishes)
Elakatothrix. (See Algae, green)
Electric fish, 43.
Electrical barrier, 44.
Electricity, 31. (See also Anesthetics)
Electrolyte concentrations, 11. (See also Blood, fish)
Elimination, 70. (See also Residues)
Elliptio sp. (See Mussels)
Elmidae. (See Beetles, riffle)
Elodea sp. (See Water weed)
Embryonic development, 64.
Endosulfan. (See Thiodan)
Endrin, 3, 35. (See also Insecticides, cyclodione)
Engraulidae. (See Anchovies)
Ephemeroptera. (See Mayflies)
Equilibrium, loss of, 22. (See also Anesthetics)
Erimyzon sucetta. (See Chubsucker, lake)
Erythrocytes, 16. (See also Anesthetics)
Erythromycin thiocyanate, 18. (See also Therapeutants)

Esocidae. (See Pike; Pickerel; Muskellunge)
Esox
americanus americanus. (See Pickerel, redfin)
americanus vermiculatus. (See Pickerel, grass)
lucius. (See Pike, northern)
masquinongy. (See Muskellunge)
niger. (See Pickerel, chain)
Etheostoma
exile. (See Darter, Iowa)
flabellare. (See Darter, fantail)
nigrum. (See Darter, johnny)
Ether, 16, 31. (See also Anesthetics)
Ethinamaie, 71. (See also Anesthetics; Fish collecting aids)
Ethyl alcohol, 16. (See also Anesthetics)
2′-Ethyl-3-nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
O-Ethyl-*s*-pentachlorophenyl thiocarbonate, 44. (See also Lampricides)
Eukain, 16. (See also Anesthetics)
Excretion, 35. (See also Metabolism)
Exposure, duration of, 17.

Fallfish, 27, 40.
Fat
abdominal, 35.
peritoneal, 35.
Feces, 33, 35.
Feeding behavior, 33.
Field trials, 1, 2, 25, 26, 27, 40, 71.
Filinia. (See Rotifers)
Fingerling. (See Life stage, fishes)
Finquel. (See MS-222)
Fins, 16, 35, 52.
Fintrol Concentrate, 27, 40. (See also Antimycin)
Fintrol-5, 25, 26, 27, 28, 40. (See also Antimycin)
Fintrol-15, 26, 27, 40. (See also Antimycin)
Fintrol liquid. (See Fintrol Concentrate)
Fintrol-30, 26, 27, 40. (See also Antimycin)
Fish (See also individual species)
blood. (See Blood, fish)
collecting aids, 34, 71.
control, 1, 2, 3, 5, 26, 27, 28, 35, 37, 38, 40, 72. (See also Piscicides)
diseases. (See Diseases)
marine, 40.
muscle. (See Muscle)
nontarget, 60, 61.
tissues, 14, 41, 51, 55.
toxicants. (See Piscicides)
Flagyl, 18. (See also Therapeutants)
Flatworms (Turbellaria), 44, 58, 62. (See also Invertebrates)
Flies, 44. (See also Crane flies; Insects; Snipe flies)
biting, 12.
black, 44, 58.
deer, 4.
house, 44.
Flounders, 40.
Flow-through tests, 38, 59, 61, 62, 72. (See also Toxicity tests)
Fluorescein dye, 27. (See also Dyes)
2′-Fluoro-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
3′-Fluoro-5-nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
Food
chain, 66
passage rates, 33. (See also Voidance time)
wastes, 33. (See also Voidance time)
Foot, mussel, 70.
Formaldehyde. (See Formalin)
Formalin, 18, 67. (See also Therapeutants)
Fragilaria. (See Diatoms)
Fremling, C. R., 58.
Frogs, 2, 16, 27, 31, 40. (See also Amphibians)
bull, 2, 62.
gray tree, 62.
leopard, 62.
nerve, 31.
spermatozoa, 16.
wood, 16.
Frustulia. (See Diatoms)
Fry. (See Life stage, fishes)
Fundulus
heteroclitus. (See Mummichog)
parvipinnis. (See Killifish, California)
similis. (See Killifish, longnose)
Fungicides, 1. (See also Therapeutants; Test chemicals)
Furunculosis. (See Diseases, bacterial)

Galeichthys filis. (See *Arius felis*)
Gallbladder, 35.
Gamebirds, upland, 44. (See also Birds)
Gambusia affinis. (See Mosquitofish)
Gammarids, 44, 58.
Gammarus pseudolimnaeus. (See Scuds)
Gar
longnose, 1, 2, 40, 42.
shortnose, 1, 26, 40, 42.
spotted, 40.
Gars, 39, 68.
Gas chromatography, 50, 55, 65, 66. (See also Analytical methodology)
Gasterosteus aculeatus. (See Stickleback, threespine)
Gastropods. (See Snails)

Gaylord, W. E., 7.
Geissel, L. D., 56.
General toxicant. (See Piscicides)
Gilderhus, P. A., 27, 49, 54, 63, 66.
Gills, 35, 39.
  mussel, 70.
Ginglymostoma cirratum. (See Shark, nurse)
Girella nigricans. (See Opaleye)
Glenodinium. (See Algae, dinoflagellate)
Gloeotrichia. (See Algae, blue-green)
Glossiphonia sp. (See Leeches)
Glucuronic acid, 35.
Gnathonemus moori. (See Electric fish)
Goldfish, 1, 2, 6, 9, 10, 11, 16, 19, 20, 22, 24, 25, 26, 27, 32, 33, 35, 37, 38, 40, 41, 46, 49, 60, 61, 68, 72.
Golenkinia. (See Algae, green)
Gomphonema. (See Diatoms)
Gonadectomy, 16.
Gonads, 35.
Graptoleberis. (See Water fleas)
Great Lakes, 44, 57, 59, 60, 61, 62, 63, 64, 66. (See also Lamprey, sea)
Growth
  inhibitors, 1. (See also Test chemicals)
  rates, 5.
  stimulants, 1. (See also Test chemicals)
Guinea pigs, 31.
Gulls, 27. (See also Birds)
Gunnel, crescent, 8.
Guppy, 6, 10, 16, 20.
Guts, 35.
Gyraulus. (See Snails)
Gyrinus. (See Beetles)
Gyrodactylus. (See Diseases, parasitic)
Gyrosigma. (See Diatoms)

Hagfish, Atlantic, 43.
Half-life, 46, 72. (See also Biological activity)
Haliplus. (See Beetles)
Halogenated hydrocarbons, 1. (See also Test chemicals)
Handling, 1.
Hansen, C. R., Jr., 57.
Harman, P. D., 41, 45, 49, 50, 54, 55.
Hauling of fish, 16. (See also Transporting; Handling)
Head, fish, 52. (See also Residues)
Hearts, 16, 35.
Hematocrit, 11, 16. (See also Blood, fish)
Hematocrit, YSI Electric, 11.
Hemiclepsis sp. (See Leeches)
Hemiptera. (See Bugs)
Hemoglobin, 16. (See also Blood, fish)
Hemorrhages, 34. (See also Blood, fish)
Henegar, D. L., 3.
Heptachlor, 3. (See also Insecticides, cyclodione)
Herbicides, 56.
Herons, 27. (See also Birds)
Herpobdellidae. (See Leeches)
Herring, Atlantic, 16.
Herrings, 2, 39, 71.
Hesselberg, R. J., 21.
Hexagenia sp. (See Mayflies)
Hexarthra. (See Rotifers)
6,7,8,9,10,10-Hexochloro 1,5,5*a*, 6,9,9*a*-hexahydro-6,9-methano-2,4,3-benzodioxathiepin-3-oxide. (See Thiodan)
Hirudinea. (See Leeches)
Hogan, J. W., 19, 26, 32.
Hormonal spawning
  inducers, 1. (See also Test chemicals; Reproduction)
  inhibitors, 1. (See also Test chemicals; Reproduction)
Horseflies, 4. (See also Invertebrates)
Howell, J. H., 38, 64.
Howland, R. M., 29, 34.
Humans, 19, 31.
Hunn, J. B., 42.
Hyamine 3500, 32. (See also Disinfectants)
Hydracarina. (See Mites, water)
Hydras, 44, 58.
Hydrocanthus. (See Beetles)
Hydrodicton. (See Algae, green)
Hydroporus. (See Beetles)
Hydroptila. (See Caddis flies)
1-(2-Hydroxyethyl)-2-methyl-5-nitroimidazole. (See Flagyl)
Hyla versicolor. (See Frog, gray tree)
Hypentelium nigricans. (See Sucker, northern hog)
Hypnotic, 30, 31. (See also Transporting)
Hypophysectomy, 16.

Ichthyomyzon sp. (See Lampreys)
Ictaluridae. (See Catfishes; Bullhead)
Ictalurus
  catus. (See Catfish, white)
  furcatus. (See Catfish, blue)
  melas. (See Bullhead, black)
  natalis. (See Bullhead, yellow)
  nebulosus. (See Bullhead, brown)
  punctatus. (See Catfish, channel)
Ichthyophthirius, 18. (See also Diseases)
Ictiobus sp. (See Buffalo, hybrid)
  bubalus. (See Buffalo, smallmouth)
  cyprinellus. (See Buffalo, bigmouth)
In vitro studies, 39.
In vivo studies, 39.
Index, additive. (See Additive index)
Inorganic products, 1. (See also Test chemicals)
Insects, aquatic, 27, 40, 57, 59, 66. (See also Invertebrates)
Insecticides, 35.

Insecticides, cyclodione, 3.
Invertebrates, 4, 8, 27, 57, 59, 62, 70.
4'Iodo-3,5-dinitrobenzanilide, 9. (See also Nitrobenzanilides)
2'-Iodo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
3'-Iodo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
4'-Iodo-3-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
4'-Iodo-5-nitrosalicylanilide, 9, 37. (See also Nitrosalicylanilides)
Ion exchange resins, 44.
Ischnura verticalis. (See Damselflies)
Isobornyl thiocyanoacetate. (See Thanite)
Isodrin, 3. (See also Insecticides, cyclodione)
Isopoda. (See Sowbugs, aquatic)

Jack
  chiselmouth. (See Whitefish, mountain)
  crevalle (common Jack), 40.
Jacks, 40.
Jackson, H. M., 33.
Jar-rinsing rack, 21.
Johnson, H. E., 56, 70.
Julin, A. M., 11, 13, 17, 22.

Kawatski, J. A., 57.
Keratella sp. (See Rotifers)
Kidney, 39.
  diseases. (See Diseases, kidney)
  samples, 4, 35, 41.
  tissues, 14, 15, 16.
Killifish
  California, 16, 31.
  longnose, 26, 40.
King, E. L., Jr., 38.
Kirchneriella. (See Algae, green)
Kocaine, 16. (See also Anesthetics)

Labor-saving apparatus. (See Apparatus, labor-saving)
Laboratory, 1.
  mobile wet, 44.
Lake treatments, 3, 40.
Lampetra sp. (See Lamprey)
  lamottei. (See Lamprey, American brook)
Lamprey, 44.
  American brook, 7, 27, 40, 44, 63.
  sea, 7, 9, 19, 26, 38, 40, 44, 57, 59, 60, 61, 62, 63, 64, 65, 66, 69.
Lamprey irritants, 44.
Lampreys, 44.
Lampricides, 1, 7, 19, 38, 44, 56, 58, 59, 60, 61, 62, 63, 69, 70.
Lane, T. H., 33.
Larinae. (See Gulls)
Larvicide, lamprey. (See Lampricides)
Lecane. (See Rotifers)
Ledvina, M. M., 57.
Leeches, 2, 4, 44, 58. (See also Invertebrates)
Leiostomus xanthurus. (See Spot)
Lemna minor. (See Duckweed)
Lennon, R. E., 1, 2, 26, 27, 40.
Lepisosteus
  oculatus. (See Gar, spotted)
  osseus. (See Gar, longnose)
  platostomus. (See Gar, shortnose)
Lepomis
  auritus. (See Sunfish, redbreast)
  cyanellus. (See Sunfish, green)
  gibbosus. (See Pumpkinseed)
  gulosus. (See Warmouth)
  humilis. (See Sunfish, orangespotted)
  macrochirus. (See Bluegill)
  marginalus. (See Sunfish, dollar)
  megalotis. (See Sunfish, longear)
  microlophus. (See Sunfish, redear)
Lestes. (See Damselflies)
Life stage, fishes, 1, 26, 27, 44, 63, 64, 69.
  adult, 26.
  egg, 18, 22, 26, 27, 35, 64, 69, 72.
  fingerling, 26, 69, 72.
  fry, 26, 69.
Light intensity, Effects of, 46. (See also Efficacy)
Limnephilus. (See Caddis flies)
Linear index, 67. (See also Additive index)
Literature reviews, 44.
Live cages, 40, 68.
Livebearers, 71.
Liver, 39.
  samples, 35, 41.
  tissues, 14, 15, 16, 51.
Loading rates, 68. (See also Toxicity tests)
Locke, D. O., 24.
Logperch, 38, 44.
Lota lota. (See Burbot)
Luhning, C. W., 25, 28, 41, 45, 50, 51, 52, 55.
Lymnaea. (See Snails)
Lyngbya. (See Algae, blue-green)
d-Lysergic acid, 71. (See also Fish collecting aids)

Madtom, tadpole, 27, 40.
Mahdi, M. A., 6.
Maki, A. W., 56, 70.
Malachite green, 18, 34, 67. (See also Therapeutants; Chemical mixtures)
Malathion, 67. (See also Chemical mixtures)
Mallards, 27. (See also Birds)
Mammals, 16, 40, 44.

Margin of safety. (See Safety, margin)
Marking, L. L., 9, 10, 12, 17, 19, 23, 30, 36, 37, 38, 46, 48, 53, 60, 61, 62, 67, 69, 72.
Marking for identification
  fish, 1, 16, 17.
  lamprey, 44.
Mayflies, 1, 2, 4, 27, 38, 44, 58, 59, 62, 66. (See also Insects, aquatic; Invertebrates)
  nymph, 44, 58, 59.
McNeil-JR-7464, 34. (See also Fish collecting aids)
Meehan, W. R., 8.
Megaloptera. (See Dobsonflies)
Melosira. (See Diatoms)
Mercapto, 1. (See also Test chemicals)
Mercuric sulfide, 44. (See also Marking for identification, lamprey)
Merismopedia. (See Algae, blue-green)
Merthiolate, 18. (See also Therapeutants; Disinfectants)
Metabolic rates, 39, 43.
Metabolism, 22, 42, 46, 52.
Metabolites, 35, 51, 52.
2′-Methoxy-4′-nitro-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
4′-Methoxy-2-nitro-3-nitrosalicylanilide, 37. (See also Nitrosalicylanilides)
2-Methyl-2-butanol, 31. (See also Anesthetics)
Methylene blue, 18, 71. (See also Therapeutants)
Methyl-parafynol, 16, 31. (See also Anesthetics)
2-Methyl-2,4-pentamediol, 31. (See also Anesthetics)
3-Methyl-1-pentyn-3-ol. (See Methylpentynol)
3-Methyl-pentyne-ol-3, 31.
Methylpentynol, 16, 29, 30, 31. (See also Anesthetics)
Methylpentynol carbamate, 31. (See also Anesthetics)
2-Methyl-2-propanol, 31. (See also Anesthetics)
N′-(4-Methyl-2-pyrimidyl)sulfanilamide. (See Sulfamerazine)
2-Methylquinoline. (See Quinaldine)
5′-Methyl-*o*-salicylanisidide, 9.
Mice, 16, 31.
Micractinium. (See Algae, green)
Microhematocrit, 11, 16. (See also Hematocrit)
Microorganisms, 3. (See also Bacteria; Degradation)
Micropterus
  dolomieui. (See Bass, smallmouth)
  salmoides. (See Bass, largemouth)
Microspora. (See Algae, green)
Midges, 2, 4, 8, 27, 35, 44, 57, 58, 66. (See also Insects, aquatic; Invertebrates)
  biting, 4.
  phantom, 4.
Minnow
  bluntnose, 3, 6, 27, 35, 40, 44.
  fathead, 1, 2, 4, 5, 10, 16, 19, 26, 27, 32, 33, 34, 37, 38, 40, 44, 60, 67, 72.
  sheepshead, 26, 40.
Minnows, 2, 71.
Minytrema melanops. (See Sucker, spotted)
Mites, water, 4.
Mixtures. (See Chemical mixtures)
Mode of action, 2, 22, 39.
Molluscicides, 19. (See also Bayer 73)
Mollusks, bivalve. (See Mussels)
Molly, sailfin, 20.
Mononitrophenol, 44. (See also Lampricides)
Monostyla. (See Rotifers)
Morone
  chrysops. (See Bass, White)
  saxatilis. (See Bass, striped)
Mosquitoes, 2, 4, 35, 62. (See also Invertebrates; Insects, aquatic)
Mosquitofish, 10, 16, 27, 28, 31, 40, 71.
Mougeotia. (See Algae, green)
Moxostoma macrolepidotum. (See Redhorse, shorthead)
Mozambique mouthbrooder, 19, 26, 40.
MS-222, 12, 13, 14, 15, 16, 17, 22, 23, 24, 29, 31, 34, 35, 41, 42, 43, 45, 51, 52, 53, 54, 55, 67. (See also Anesthetics; Chemical mixtures)
Mudminnow, central, 27, 40, 44.
Mudpuppy, 44. (See also Salamanders)
Mummichog, 16.
Musca domestica. (See Flies, house)
Muscle
  residues, 17.
  samples, 35, 41.
  tissues, 14, 15, 16, 45, 50, 52, 65.
Muskellunge, 41, 45, 54.
Mussels, 4, 8, 38, 44, 62, 70. (See also Invertebrates)
Mylocheilus caurinus. (See Peamouth)
Myriophyllum sp. (See Parrot feather)
Myxine glutinosa. (See Hagfish, Atlantic)

Natrix. (See Snakes, water)
Navicula. (See Diatoms)
Navicula pelliculosa. (See Diatoms)
Necturus maculosus. (See Mudpuppy)
Needham, R. G., 4.
Neguvon, 18. (See also Therapeutants)
Nembutal, 16. (See also Anesthetics)
Nickel sulfate, 18. (See also Therapeutants)
3-Nitrobenzanilide, 9. (See also Nitrobenzanilides)
Nitrobenzanilides, 37. (See also Piscicides)
Nitrogen-bearing hydrocarbons, 1. (See also Test chemicals)
Nitrophenol, 44. (See also Lampricides)
3-Nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
Nitrosalicylanilides, 9, 19, 37. (See also Piscicides)
4′-Nitro-*o*-salicylanisidide, 9.
2′-Nitro-*p*-salicylanisidide, 9.
3-Nitro-2′,3′-salicyloxylidide, 9.
3-Nitro-2′,4′-salicyloxylidide, 9.

3-Nitro-2',5'-salicyloxylidide, 9.
3-Nitro-2',6'-salicyloxylidide, 9.
Nitzschia sp. (See Diatoms)
33 NCS, 38. (See also Lampricides; Piscicides)
Nodularia. (See Algae, blue-green)
Nonrepellency, 40. (See also Antimycin)
Nostoc linckia. (See Algae, blue-green)
Notemigonus crysoleucas. (See Shiner, golden)
Notonecta sp. (See Back swimmers)
Notonectidae. (See Back swimmers)
Notropis
  blennius. (See Shiner, river)
  cornutus. (See Shiner, common)
  heterodon. (See Shiner, blackchin)
  heterolepis. (See Shiner, blacknose)
  longirostris. (See Shiner, longnose)
  stramineus. (See Shiner, sand)
  texanus. (See Shiner, weed)
Noturus
  flavus. (See Stonecat)
  gyrinus. (See Madtom, tadpole)
Novocaine, 16. (See also Anesthetics)
Noxfish, 72. (See also Rotenone)
Nutrition, 33.

Odonata. (See Dragonflies; Damselflies)
Oecetis. (See Caddis flies)
Oedogonium. (See Algae, green)
Oligochaeta. (See Earthworms, aquatic)
Olson, L. E., 60.
Oncorhynchus
  gorbuscha. (See Salmon, pink)
  keta. (See Salmon, chum)
  kisutch. (See Salmon, coho)
  nerka. (See Salmon, sockeye)
  tshawytscha. (See Salmon, chinook)
Oöcystis. (See Algae, green)
Opaleye, 16, 31.
Ophiogomphus sp. (See Dragonflies)
Orconectes nais. (See Crayfishes)
Organic sulfoxides, 20. (See also Dimethyl sulfoxide)
Osmeridae. (See Smelt)
Osmerus mordax. (See Smelt, rainbow)
Osmoregulators, 1. (See also Transporting; Handling; Test chemicals)
Ostracoda. (See Shrimp, seed)
Oxygen
  capacity, 16. (See also Anesthetics)
  consumption, 16, 39.
  levels, 3.

Paddlefish, 27, 40.
Palaemonetes kadiakensis. (See Shrimp, glass)
Pandorina. (See Algae, green)
Panthesin, 16. (See also Anesthetics)
Paracheirodon innesi. (See Tetra, neon)
Paralabrax clathratus. (See Bass, kelp)
Paraldehyde, 16, 31. (See also Anesthetics)
Parasiticides, 1, 18. (See also Therapeutants; Test chemicals)
Parrot feather, 2, 3, 4, 71. (See also Plants, aquatic)
Partial reclamation. (See Reclamation, partial)
Peamouth, 40.
Pediastrum. (See Algae, green)
Pelecypoda. (See Mussels)
3-Pentanol, 31. (See also Anesthetics)
Pentobarbital sodium, 31. (See also Anesthetics)
Perca
  flavescens. (See Perch, yellow)
  fluviatilis. (See Perch, European)
Perch, 2, 39, 71.
  European, 39.
  yellow, 1, 2, 3, 4, 5, 7, 10, 16, 19, 20, 26, 27, 33, 34, 35, 37, 38, 40, 44, 60, 61, 67, 69, 71, 72.
Percichthyidae. (See Bass)
Percidae. (See Perch; Logperch; Walleye)
Percina caprodes. (See Logperch)
Percopsidae. (See Trout-Perches)
Percopsis omiscomaycus. (See Trout-perch)
Periphyton, 44. (See also Plants, aquatic)
Persistence, 46, 72.
Pescilia latipinna. (See *Poecilia latipinna*)
Petromyzon marinus. (See Lamprey, sea)
Petromyzontidae. (See Lampreys)
pH, 2, 13, 17, 19, 22, 25, 26, 27, 28, 29, 30, 31, 32, 35, 38, 40, 44, 46, 47, 48, 49, 53, 54, 58, 59, 60, 63, 65, 69, 71, 72.
Phenobarbitol, 31. (See also Anesthetics)
Phenols, 1. (See also Plant extracts; Test chemicals)
Phenoxyethanol, 16, 31. (See also Therapeutants; Anesthetics)
2-Phenoxyethanol, 31. (See also Anesthetics)
4'-Phenylazo-3-nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
dl-1-(1-Phenyl-ethyl)-5-(propoxy-carbonyl)-imidazole hydrochloride. (See McNeil-JR-7464)
Pholis laeta. (See Gunnel, crescent)
Phormidium. (See Algae, blue-green)
Phosphorus-bearing hydrocarbons, 1. (See also Test chemicals)
Photoelectric amplifier, 44.
Phoxinus
  eos. (See Dace, northern redbelly)
  erythrogaster. (See Dace, southern redbelly)
Phryganea. (See Caddis flies)
Physa sp. (See Snails)
Physical
  characterization, 2.
  properties, 44.
Phytoplankters, 2, 4. (See also Plankton; Algae)
Piavis, G. W., 64.

Pickerel
chain, 27, 40, 71.
grass, 40.
redfin, 71.
Pike, 2, 39, 71.
northern, 1, 2, 3, 4, 7, 10, 12, 16, 22, 23, 26, 27, 30, 32, 33, 35, 38, 40, 41, 42, 45, 49, 50, 54, 55, 60, 71, 72.
Pimephales
notatus. (See Minnow, bluntnose)
promelas. (See Minnow, fathead)
Pinnularia. (See Diatoms)
Piscicides, 1, 3, 4, 5, 6, 9, 19, 26, 27, 37, 40, 72. (See also Lampricides)
Pisidium sp. (See Mussels)
Plankton, 2, 3, 4. (See also Algae; Phytoplankters; Zooplankters)
Plant extracts, 1.
Plants, aquatic, 1, 2, 4, 40, 44, 66, 71.
Platyfish, southern, 20.
Platyias. (See Rotifers)
Plea. (See Back swimmers)
Plecoptera. (See Stone flies)
Pleurosigma. (See Diatoms)
P.M.A., 18. (See also Therapeutants)
Poecilia
latipinna. (See Molly, sailfin)
reticulata. (See Guppy)
Poeciliidae. (See Livebearers)
Polyarthra. (See Rotifers)
Polycystis. (See Algae, blue-green)
Polyethelene bag, 68. (See also Toxicity, on-site test)
Polygonum sp. (See Smartweed)
Polyodon spathula. (See Paddlefish)
Pomoxis
annularis. (See Crappie, white)
nigromaculatus. (See Crappie, black)
Pompanos, 40.
Pondweed, sago, 2, 4, 71. (See also Plants, aquatic)
Pondweeds, 2, 3, 4.
Pool
bioassay, 1.
vinyl wading, 2.
Portable metering device, 44.
Potamogeton sp. (See Pondweeds)
pectinatus. (See Pondweed, sago)
Potassium permanganate ($KMnO_4$), 26, 27, 40, 67, 72. (See also Chemical mixtures; Detoxification)
Potency rating, 36, 37. (See also Toxicity tests)
Pour-portioner drum meter, 44.
Preparation, 47.
Probezzia. (See Midges, biting)
Pro-Noxfish, 72. (See also Rotenone)
Prophylactics, 1. (See also Therapeutants; Test chemicals)
Prosopium
cylindraceum. (See Whitefish, round)
williamsoni. (See Whitefish, mountain)
Proteins, 1, 11. (See also Test chemicals)
Protozoa, 4.
Pseudomonas sp. (See Bacteria)
Psychomyia. (See Caddis flies)
Pteronarcys sp. (See Stone flies)
Ptychocheilus oregonensis. (See Squawfish, northern)
Pumpkinseed, 1, 2, 10, 26, 27, 33, 38, 40, 44, 67, 71.
Puntius filamentosus. (See Barb, black-spot)
Pylodictis olivaris. (See Catfish, flathead)
Pyridylmercuric acetate. (See P.M.A.)
Pyrrophyta. (See Algae, dinoflagellate)

Quillback, 26, 40.
Quinacrine hydrochloride, 18. (See also Therapeutants)
Quinaldine, 16, 22, 23, 24, 31, 34, 50, 55. (See also Anesthetics)
Quinaldine sulfate ($QdSO_4$), 47, 48, 49, 50, 53, 54, 55, 67. (See also Anesthetics; Chemical mixtures)
Quinine hydrochloride, 18. (See also Therapeutants)

Rabbits, 31, 44.
Radioactive cobalt, 16. (See also MS-222)
Radioassay, 70. (See also Residues)
Rain, Effects of, 71.
Rana
catesbeiana. (See Frog, bull)
pipiens. (See Frog, leopard)
sylvatica. (See Frog, wood)
temporaria. (See *Rana sylvatica*)
Ranidae. (See Frogs)
Rat, 19, 31, 35, 39, 44.
Ray, cownose, 47.
Rays, 16, 40.
Reclamation, partial, 40.
Recrystallization, 47. (See also Quinaldine sulfate)
Recycling test apparatus. (See Apparatus, recycling test)
Redfish, 40.
Redhorse
northern. (See Redhorse, shorthead)
shorthead, 11, 40, 71.
Reference toxicant. (See Toxicant, reference)
Repellency, 34. (See also Repellents)
Repellents, 1. (See also Test chemicals)
Reproduction, 1, 16, 28, 59.
Reservoirs, treatment, 3.
Residues, 14, 15, 16, 35, 44, 45, 50, 52, 55, 59, 65, 66, 70.
Respiration, 39.
rate, 16.

Rhinichthys
atratulus. (See Dace, blacknose)
cataractae. (See Dace, longnose)
Rhinoptera bonasus. (See Ray, cownose)
Rhizoclonium. (See Algae, green)
Rhodamine B, 27, 67. (See also Dyes; Chemical mixtures)
Richardsonius balteatus. (See Shiner, redside)
RO-40403, 71. (See also Anesthetics; Fish collecting aids)
Roccal, 18. (See also Therapeutants)
Rotenoids, 1. (See also Rotenone; Plant extracts; Test chemicals)
Rotenone, 5, 6, 34, 35, 40, 67, 71, 72. (See also Piscicides; Fish collecting aids; Insecticides; Chemical mixtures)
Rotifers, 4, 27. (See also Invertebrates)
Ruelene, 18. (See also Therapeutants)

Safety
index, 12, 16, 17, 23, 53.
margin, 19, 53, 60, 69.
Sagittaria sp. (See Arrowhead)
Salamander
mole, 27.
spotted, 16.
tiger, 2.
Salamanders, 2, 16, 27, 40, 44. (See also Amphibians)
Salicylanilides, 1, 9.
Salmo
clarki. (See Trout, cutthroat)
gairdneri. (See Trout, rainbow)
salar. (See Salmon, Atlantic)
trutta. (See Trout, brown)
Salmon
Atlantic, 24, 27, 40, 67, 72.
chinook, 8, 16, 22, 44, 60, 71, 72.
chum, 8, 16.
coho, 8, 16, 20, 22, 24, 40, 44, 48, 49, 50, 53, 55, 60, 61, 69, 72.
kokanee. (See Salmon, sockeye)
landlocked, 16.
pink, 8, 16.
silver. (See Salmon, coho)
sockeye, 8, 16, 22, 40.
Salmonidae. (See Salmonids)
Salmonids, 10, 13, 15, 16, 17, 29, 54, 61, 71.
Salvelinus
fontinalis. (See Trout, brook)
malma. (See Dolly varden)
namaycush. (See Trout, lake)
Sanders, H. O., 59.
Scalefish, 25, 40.
Scales, 35.
Scaphirhynchus platorynchus. (See Sturgeon, shovelnose)
Scenedesmus quadricauda. (See Algae, green)
Schnick, R. A., 44.
Schoettger, R. A., 11, 13, 14, 15, 16, 17, 22, 29, 35, 39.
Scirpus sp. (See Bulrush)
Scuds (Amphipods), 2, 4, 8, 27, 44, 58. (See also Invertebrates)
Sculpin sp., 44, 66.
coastrange, 8.
mottled, 8, 27, 40.
prickly, 8.
reticulate, 8.
torrent, 8, 40.
Sebastes marinus. (See Redfish)
Secobarbital sodium, 31. (See also Anesthetics)
Sedation, 13, 22, 29, 53, 54. (See also Anesthetics)
Sedatives, 1, 30, 31. (See also Test chemicals; Anesthetics)
Selective piscicide, 1, 9, 25, 28, 35, 38, 40. (See also Piscicides)
removal, 28.
Selective toxicant. (See Selective piscicide)
Selenastrum capricornutum. (See Algae, green)
Semotilus
atromaculatus. (See Chub, creek)
corporalis. (See Fallfish)
Serranidae. (See Bass)
Shad, 31.
gizzard, 1, 2, 26, 27, 40, 71.
threadfin, 16.
Shark
dogfish. (See Dogfish, spiny)
nurse, 47.
Sharks, 16.
Sheridan, W. L., 8.
Shiner
blackchin, 40.
blacknose, 40, 44.
common, 27, 35, 38, 40.
golden, 1, 2, 3, 4, 6, 24, 25, 26, 27, 28, 33, 35, 40, 44, 60, 61, 71.
longnose, 40.
redside, 40.
river, 1.
sand, 38.
weed, 40.
Shrimp
glass, 62.
seed, 4, 27, 62.
Shrimps, 27, 66.
Siamese fighting fish, 16.
Sideswimmers. (See Scuds)
Sigara sp. (See Water boatmen)

Sills, J. B., 47, 49, 50, 54, 55, 65, 66.
Silurus glanis. (See Wels, European)
Simocephalus sp. (See Water fleas)
Skin, 35.
Smartweed, 3. (See also Plants, aquatic)
Smelt, 7, 8.
  American. (See Smelt, rainbow)
  rainbow, 40.
Smith, B. R., 7.
Snails, 1, 2, 4, 8, 19, 38, 44, 58, 62, 66. (See also Invertebrates)
Snakehead fish, 35.
Snakes, water, 27.
Snipe flies, 66.
Sodium
  amytol, 16, 31. (See also Anesthetics)
  barbital, 16. (See also Anesthetics)
  cyanide, 71. (See also Fish collecting aids)
  ethylmercurithiosalicylate. (See Merthiolate)
  sulfite, 71. (See also Fish collecting aids)
Solvent, 20. (See also Dimethyl sulfoxide)
Soporific, 29. (See also Sedatives)
Sowbugs, aquatic (Isopoda), 4, 8, 44, 58, 59. (See also Invertebrates)
Spawning aid, 13, 16, 17, 31. (See also Anesthetics)
Spectrophotometry, 34, 51, 55. (See also Analytical methodology)
Spirogyra sp. (See Algae, green)
Splake (brook trout X lake trout), 16.
Spleen, 35.
Spot, 40.
Squalus acanthias. (See Dogfish, spiny)
Squawfish, northern, 1, 40.
Standard procedure, 51, 72.
Standardization, 10, 72.
Starkey, R. J., 9.
Static bioassay. (See Toxicity tests)
Staurastrum. (See Algae, green)
Stenonema sp. (See Mayflies)
Stephanoceros sp. (See Rotifers)
Sterilants, 1. (See also Test chemicals; Reproduction)
Sternarchus albifrons. (See Eel, gymnotid)
Sterninae. (See Terns)
Steroids, 1. (See also Test chemicals)
Sticklebacks, 2.
  brook, 1, 2, 10, 26, 27, 40.
  threespine, 8.
Stigeoclonium tenue. (See Algae, green)
Stingrays, 16.
Stizostedion vitreum vitreum. (See Walleye)
Stonecat, 44.
Stone flies, 38, 44, 58, 66. (See also Insects, aquatic; Invertebrates)
Stoneroller, 2, 6, 26, 27, 40.
Streams, 27, 34, 59, 60, 61, 62, 68.
  ecosystem, 66.
  treatments, 40, 66.
Strovain, 16. (See also Anesthetics)
Sturgeon
  shovelnose, 11.
  white, 16.
4-Styrylpyridine, 31. (See also Anesthetics)
Substrate, 3, 63.
  artificial, 58.
Sucker
  bridgelip, 40.
  common. (See Sucker, white)
  largescale, 40.
  longnose, 38, 40, 72.
  northern hog, 27, 40.
  spotted, 11, 26, 40, 42.
  western white. (See Sucker, white)
  white, 1, 2, 3, 4, 7, 16, 19, 26, 27, 33, 35, 38, 40, 44, 49, 54, 60, 71, 72.
Suckers, 2, 39.
Sudan III, 33. (See also Dyes)
Sulfamerazine, 16, 18. (See also Therapeutants)
Sulfamethazine, 18. (See also Therapeutants)
Sulfisoxazole, 18. (See also Therapeutants)
Sulfonamides, 16. (See also Sulfamerazine)
Sulfur-bearing hydrocarbons, 1. (See also Test chemicals)
Sunfish population, 28.
Sunfish
  dollar, 71.
  green, 1, 2, 4, 10, 19, 20, 24, 25, 26, 27, 32, 33, 37, 38, 40, 44, 46, 48, 60, 71, 72.
  hybrid, 2, 40.
  longear, 1, 2, 10, 26, 33, 40.
  orangespotted, 3, 4, 27, 28, 40.
  redbreast, 26, 28, 40.
  redear, 1, 19, 28, 32, 40, 61, 71.
Sunfishes, 2, 10, 39, 71.
Sunlight, 16, 19, 46.
Surfacing, 34. (See also Fish collecting aids)
Survey tools, 44. (See also Fish collecting aids)
Suspended matter, 44.
Svendsen, G. E., 31, 39.
Sympetrum. (See Dragonflies)
Synchaeta. (See Rotifers)
Synechocystis. (See Algae, blue-green)
Synedra. (See Diatoms)
Synergism, 53, 57, 67, 69. (See also Antagonism)
Synthetic diet, 33.

Tadpoles, 1, 2, 16, 25, 44. (See also Frogs)
Tendipedidae. (See Midges)

Tendipes. (See Midges)
Terns, 27. (See also Birds)
Tertiary amyl alcohol, 16, 31. (See also Anesthetics)
4-Tertiary-butyl-2-chlorophenyl methyl methylphosphoramidate. (See Ruelene)
Test animal, 68.
Test chemicals, 1.
Testudinella. (See Rotifers)
Tetra, neon, 20.
Tetraedron. (See Algae, green)
2′,3,4′,5-Tetranitrobenzanilide, 9. (See also Nitrobenzanilides)
Tetrastrum. (See Algae, green)
TFM, 8, 38, 44, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 69, 70.
Thanite, 71. (See also Fish collecting aids)
Therapeutants, 18.
Therapeutics. (See Therapeutants)
Thermocline, 40.
Thin layer chromatography, 41, 45, 51. (See also Analytical methodology)
Thioates, 1. (See also Test chemicals)
Thiodan, 35. (See also Insecticides; Piscicides)
Thiozines, 1. (See also Test chemicals)
Lg-Threo-2-(5-nitro-2-furyl)-5-p-nitrophenyl)-2-oxazoline-4-methanol. (See TV-1096)
Tiguvon, 18. (See also Therapeutants)
Tilapia sp. (See Mozambique mouthbrooder)
Tipulidae. (See Crane flies)
Tissue, 15, 16, 35.
Togoperia sp. (See Stone flies)
Toxaphene, 3, 4, 5, 6, 7, 8, 35, 44. (See also Insecticides, cyclodione; Piscicides)
Toxicant, reference, 10.
Toxicity, 1, 3, 9, 12, 16, 17, 18, 19, 20, 21, 23, 26, 30, 31, 32, 34, 35, 36, 37, 44, 48, 53, 56, 58, 59, 60, 61, 62, 67, 69.
  on-site test, 68.
  synergistic. (See Synergism)
  tests, 1, 2, 9, 10, 12, 17, 18, 19, 20, 21, 23, 26, 30, 32, 34, 35, 36, 37, 38, 40, 46, 48, 53, 56, 57, 58, 59, 60, 61, 62, 67, 68, 69, 72.
Tranquilizers, 34. (See also Fish collecting aids; Anesthetics)
Transporting, 1, 16, 17, 31.
Triazines, 1. (See also Test chemicals)
Tribromoethanol, 16, 31, 71. (See also Anesthetics; Fish collecting aids)
Tribromomethanol. (See Tribromoethanol)
Tricaine methanesulfonate. (See MS-222)
1, 1, 1-Trichloro-2,2-bis(p-chlorophenyl)ethane. (See *p-, p′* DDT).
3,4,6-Trichloro-2-nitrophenol, 44. (See also Lampricides)
2′,4′,6′-Trichloro-3-nitrosalicylanilide, 9. (See also Nitrosalicylanilides)
Trichocerca. (See Rotifers)
Trichodina. (See Diseases, parasitic)
Trichoptera. (See Caddis flies)
3-Trifluormethyl-4-nitrophenol. (See TFM)
3-Trifluoromethyl-4-nitrophenol. (See TFM)
Triggerfish, gray, 40.
3,3′,5-Trinitrobenzanilide, 9. (See also Nitrobenzanilides)
Trochosphaera. (See Rotifers)
Trolene, 18. (See also Therapeutants)
Trout, 2.
  brook, 1, 7, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 26, 27, 29, 30, 31, 34, 38, 40, 44, 48, 49, 50, 53, 54, 55, 61, 69, 72.
  brown, 2, 7, 10, 11, 12, 13, 15, 16, 18, 22, 23, 26, 27, 29, 30, 31, 32, 34, 38, 39, 40, 48, 49, 50, 53, 54, 55, 60, 61, 65, 69.
  cutthroat, 16, 40.
  lake, 10, 11, 12, 13, 15, 16, 18, 20, 22, 23, 24, 26, 29, 30, 31, 32, 33, 38, 40, 48, 49, 50, 53, 54, 55, 60, 61, 65, 69, 72.
  rainbow, 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 26, 27, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 42, 43, 44, 46, 48, 49, 50, 52, 53, 54, 55, 60, 61, 65, 66, 67, 69, 72.
  splake. (See Splake)
  steelhead. (See Trout, rainbow)
Trout-perch, 38, 44.
Trout-perches, 38.
Tubifex tubifex. (See Earthworms, aquatic)
Tubificids. (See Earthworms, aquatic)
Turbellaria. (See Flatworms)
Turbidity, 3, 26, 44, 71. (See also Water quality)
Turtle
  common snapping, 44.
  painted, 44.
Turtles, 2, 27, 40, 44.
Tutokain, 16. (See also Anesthetics)
TV-1096, 18. (See also Therapeutants)
Typha latifolia. (See Cattail)

Umbra limi. (See Mudminnow, central)
Uptake, rate of, 59, 70. (See also Residues)
Urethane, 16, 31. (See also Anesthetics)

Valvata sp. (See Snails)
Viscera
  fish, 52.
  mussel, 70.
Voidance time, 33.
Volvox. (See Protozoa)

Walker, C. R., 1, 2, 9, 14, 15, 17, 38.
Walleye, 1, 2, 3, 4, 7, 11, 12, 16, 22, 23, 26, 27, 30, 31, 33, 38, 40, 41, 44, 45, 48, 49, 50, 54, 55, 60, 71, 72.
Walnut hull extracts, 71. (See also Fish collecting aids)
Walsh, D. F., 59.
Warmouth, 25, 27, 40, 71.
Warnick, D. L., 5.
Water, 16, 20.
  chemistry, 44.
  circulation, 3.
  drinking, 19.
  hardness, 1, 12, 13, 15, 16, 19, 20, 22, 23, 24, 26, 29, 30, 31, 32, 33, 35, 38, 44, 48, 49, 53, 57, 58, 60, 61, 63, 65, 69, 71, 72.
  level, 44.
  quality, 1, 12, 17, 18, 19, 20, 23, 29, 30, 31, 32, 35, 38, 54.
  salt, 16.
  samples, 66.
  temperature, 1, 2, 3, 4, 6, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 38, 40, 44, 45, 46, 49, 50, 53, 54, 60, 63, 65, 69, 71, 72.
Water boatmen, 4, 27, 44, 58. (See also Insects, aquatic; Invertebrates)
Water fleas, 1, 2, 4, 27, 35, 44, 59, 62. (See also Invertebrates)
Water mite, 4. (See also Invertebrates)
Water snake. (See Snake, water)
Water weed, 2, 66. (See also Plants, aquatic)
Waterfowl, 44. (See also Birds)
Wels, European, 39.
White amur. (See Carp, grass)
Whitefish
  round, 7.
  mountain, 40.
Willford, W. A., 18, 20, 37, 43.
Wind, effects of, 71.
Withdrawal, 45, 50, 55. (See also Residues)
Worm, cataract, 18. (See also Diseases, parasitic)
Worms
  flat. (See Flatworms)
  earth. (See Earthworms, aquatic)
Xiphophorus maculatus. (See Platyfish, southern)

YSI electronic hematocrit. (See Hematocrit, YSI electronic)

Zebrafish, 20, 26.
Zinc, 67. (See also Chemical mixtures)
Zooplankters, 4.
Zygnema. (See Algae, green)

References

Axelrod, H. R., and L. P. Schultz. 1955. Handbook of tropical aquarium fishes. McGraw-Hill Book Co., New York. 718 pp.

Bailey, R. M., chairman. 1970. A list of common and scientific names of fishes from the United States and Canada, 3rd ed. American Fisheries Society, Special Publication No. 6, Washington, D.C. 150 pp.

Borror, D. J., and R. E. White. 1970. A field guide to the insects of America north of Mexico. Houghton Mifflin Co., Boston, Mass. 404 pp.

Conant, R. 1958. A field guide to reptiles and amphibians of eastern North America. Houghton Mifflin Co., Boston, Mass. 366 pp.

Grzimek, B. 1973. Grzimek's animal life encyclopedia, vol. 4, Fishes I. Van Nostrand Reinhold Co., New York. 531 pp.

Grzimek, B. 1974. Grzimek's animal life encyclopedia, vol. 5, Fishes II and Amphibians. Van Nostrand Reinhold Co., New York. 555 pp.

Pennak, R. W. 1953. Fresh-water invertebrates of the United States. The Ronald Press Co., New York. 769 pp.

Peterson, R. T. 1947. A field guide to the birds. Houghton Mifflin Co., Boston, Mass. 290 pp.

Prescott, G. W. 1969. How to know the aquatic plants. Wm. C. Brown Co., Dubuque, Iowa. 171 pp.

Smith, G. M. 1950. The fresh-water algae of the United States, 2nd ed. McGraw-Hill Book Co., New York. 719 pp.

Smith, P. W. 1961. The amphibians and reptiles of Illinois. Illinois Natural History Survey Bulletin 28(1). Urbana, Ill. 298 pp.

Sterba, G. 1963. Freshwater fishes of the world. The Viking Press, New York. 878 pp.

Whitford, L. A., and G. J. Schumacher. 1973. A manual of fresh-water algae. Sparks Press, Raleigh, N.C. 324 pp.

Wright, A. H., and A. A. Wright. 1949. Handbook of frogs and toads of the United States and Canada. Comstock Publishing Associates, Ithaca, N.Y. 640 pp.

Appendix I

Investigations in Fish Control 1-72

1. Laboratories and methods for screening fish-control chemicals. R. E. Lennon and C. R. Walker. 1964. 15 pp. (Also issued as U.S. Fish and Wildlife Service [USFWS] Circular 185)
2. Preliminary observations on the toxicity of antimycin A to fish and other aquatic animals. C. R. Walker, R. E. Lennon, and B. L. Berger. 1964. 18 pp. (Also issued as USFWS Circular 186)
3. Minimum lethal levels of toxaphene as a piscicide in North Dakota lakes. D. L. Henegar. 1966. 16 pp. (Also issued as USFWS Resource Publication 7)
4. Effects of toxaphene on plankton and aquatic invertebrates in North Dakota lakes. R. G. Needham. 1966. 16 pp. (Also issued as USFWS Resource Publication 8)
5. Growth rates of yellow perch in two North Dakota lakes after population reduction with toxaphene. D. C. Warnick. 1966. 9 pp. (Also issued as USFWS Resource Publication 9)
6. Mortality of some species of fish to toxaphene at three temperatures. M. A. Mahdi. 1966. 10 pp. (Also issued as USFWS Resource Publication 10)
7. Treatment of East Bay, Alger County, Michigan, with toxaphene for control of sea lampreys. W. E. Gaylord and B. R. Smith. 1966. 7 pp. (Also issued as USFWS Resource Publication 11)
8. Effects of toxaphene on fishes and bottom fauna of Big Kitoi Creek, Afognak Island, Alaska. W. R. Meehan and W. L. Sheridan. 1966. 9 pp. (Also issued as USFWS Resource Publication 12)
9. Relation of chemical structure to fish toxicity in nitrosalicylanilides and related compounds. C. R. Walker, R. J. Starkey, and L. L. Marking. 1966. 12 pp. (Also issued as USFWS Resource Publication 13)
10. Evaluation of *p,p'*-DDT as a reference toxicant in bioassays. L. L. Marking. 1966. 10 pp. (Also issued as USFWS Resource Publication 14)
11. Evaluation of an electronic method of measuring hematocrits of fish. R. A. Schoettger and A. M. Julin. 1966. 11 pp. (Also issued as USFWS Resource Publication 15)
12. Toxicity of MS-222 to selected fishes. L. L. Marking. 1967. 10 pp. (Also issued as USFWS Resource Publication 18)
13. Efficacy of MS-222 as an anesthetic on four salmonids. R. A. Schoettger and A. M. Julin. 1967. 15 pp. (Also issued as USFWS Resource Publication 19)
14. Method for determining MS-222 residues in fish. C. R. Walker and R. A. Schoettger. 1967. 10 pp. (Also issued as USFWS Resource Publication 20)
15. Residues of MS-222 in four salmonids following anesthesia. C. R. Walker and R. A. Schoettger. 1967. 11 pp. (Also issued as USFWS Resource Publication 21)
16. Annotated bibliography on MS-222. R. A. Schoettger. 1967. 15 pp. (Also issued as USFWS Resource Publication 22)
17. MS-222 as an anesthetic for channel catfish: its toxicity, efficacy, and muscle residues. R. A. Schoettger, C. R. Walker, L. L. Marking, and A. M. Julin. 1967. 14 pp. (Also issued as USFWS Resource Publication 33)
18. Toxicity of 22 therapeutic compounds to six fishes. W. A. Willford. 1967. 10 pp. (Also issued as USFWS Resource Publication 35)
19. Toxicity of Bayer 73 to fish. L. L. Marking and J. W. Hogan. 1967. 13 pp. (Also issued as USFWS Resource Publication 36)
20. Toxicity of dimethyl sulfoxide (DMSO) to fish. W. A. Willford. 1967. 8 pp. (Also issued as USFWS Resource Publication 37)
21. Labor-saving devices for bioassay laboratories. R. J. Hesselberg and R. M. Burress. 1967. 8 pp. (Also issued as USFWS Resource Publication 38)
22. Efficacy of quinaldine as an anesthetic for seven species of fish. R. A. Schoettger and A. M. Julin. 1969. 10 pp.
23. Toxicity of quinaldine to selected fishes. L. L. Marking. 1969. 10 pp.
24. Quinaldine as an anesthetic for brook trout, lake trout, and Atlantic salmon. D. O. Locke. 1969. 5 pp.
25. Field trials of antimycin as a selective toxicant in channel catfish ponds. R. M. Burress and C. W. Luhning. 1969. 12 pp.
26. Laboratory studies on antimycin A as a fish toxicant. B. L. Berger, R. E. Lennon, and J. W. Hogan. 1969. 21 pp.
27. Field trials of antimycin A as a fish toxicant. P. A. Gilderhus, B. L. Berger, and R. E. Lennon. 1969. 21 pp.
28. Use of antimycin for selective thinning of sunfish populations in ponds. R. M. Burress and C. W. Luhning. 1969. 10 pp.
29. Efficacy of methylpentynol as an anesthetic on four salmonids. R. M. Howland and R. A. Schoettger. 1969. 11 pp.

30. Toxicity of methylpentynol to selected fishes. L. L. Marking. 1969. 7 pp.
31. Annotated bibliography on methylpentynol. G. E. Svendsen. 1969. 7 pp.
32. Toxicity of Hyamine 3500 to fish. J. W. Hogan. 1969. 9 pp.
33. Voidance time for 23 species of fish. T. H. Lane and H. M. Jackson. 1969. 9 pp.
34. Laboratory studies on possible fish-collecting aids with some toxicities for the isomers of cresol. R. M. Howland. 1969. 10 pp.
35. Toxicology of Thiodan in several fish and aquatic invertebrates. R. A. Schoettger. 1970. 31 pp.
36. A method for rating chemicals for potency against fish and other organisms. L. L. Marking. 1970. 8 pp.
37. Comparative toxicity of 29 nitrosalicylanilides and related compounds to eight species of fish. L. L. Marking and W. A. Willford. 1970. 11 pp.
38. Toxicity of 33NCS (3′-chloro-3-nitrosalicylanilide) to freshwater fish and sea lampreys. L. L. Marking, E. L. King, C. R. Walker, and J. H. Howell. 1970. 16 pp.
39. Effects of antimycin A on tissue respiration of rainbow trout and channel catfish. R. A. Schoettger and G. E. Svendsen. 1970. 10 pp.
40. A resume on field applications of antimycin A to control fish. R. E. Lennon and B. L. Berger. 1970. 19 pp.
41. Identification of MS-222 residues in selected fish tissues by thin layer chromatography. J. L. Allen, C. W. Luhning, and P. D. Harman. 1970. 7 pp.
42. Dynamics of MS-222 in the blood and brain of freshwater fishes during anesthesia. J. B. Hunn. 1970. 8 pp.
43. Effect of MS-222 on electrolyte and water content in the brain of rainbow trout. W. A. Willford. 1970. 7 pp.
44. A review of literature on TFM (3-trifluormethyl-4-nitrophenol) as a lamprey larvicide. R. A. Schnick. 1972. 31 pp.
45. Residues of MS-222 in northern pike, muskellunge, and walleye. J. L. Allen, C. W. Luhning, and P. D. Harman. 1972. 8 pp.
46. Methods of estimating the half-life of biological activity of toxic chemicals in water. L. L. Marking. 1972. 9 pp.
47. Preparation and properties of quinaldine sulfate, an improved fish anesthetic. J. L. Allen and J. B. Sills. 1973. 7 pp.
48. Toxicity of quinaldine sulfate to fish. L. L. Marking and V. K. Dawson. 1973. 8 pp.
49. The efficacy of quinaldine sulfate as an anesthetic for freshwater fish. P. A. Gilderhus, B. L. Berger, J. B. Sills, and P. D. Harman. 1973. 9 pp.
50. Residue of quinaldine in ten species of fish following anesthesia with quinaldine sulfate. J. B. Sills, J. L. Allen, P. D. Harman, and C. W. Luhning. 1973. 9 pp.
51. Methods for simultaneous determination and identification of MS-222 and metabolites in fish tissues. C. W. Luhning. 1973. 10 pp.
52. Residues of MS-222, benzocaine, and their metabolites in striped bass following anesthesia. C. W. Luhning. 1973. 11 pp.
53. Toxicity of mixtures of quinaldine sulfate and MS-222 to fish. V. K. Dawson and L. L. Marking. 1973. 11 pp.
54. The efficacy of quinaldine sulfate:MS-222 mixtures for the anesthetization of freshwater fish. P. A. Gilderhus, B. L. Berger, J. B. Sills, and P. D. Harman. 1973. 9 pp.
55. Residues of quinaldine and MS-222 in fish following anesthesia with mixtures of quinaldine sulfate:MS-222. J. B. Sills, J. L. Allen, P. D. Harman, and C. W. Luhning. 1973. 12 pp.
56. Toxicity of the lampricide 3-trifluoromethyl-4-nitrophenol (TFM) to 10 species of algae. A. W. Maki, L. D. Geissel, and H. E. Johnson. 1975. 17 pp.
57. Acute toxicities of 3-trifluoro-methyl-4-nitrophenol (TFM) and 2′,5-dichloro-4′-nitrosalicylanilide (Bayer 73) to larvae of the midge *Chironomus tentans*. J. A. Kawatski, M. M. Ledvina, and C. R. Hansen. 1975. 7 pp.
58. Acute toxicity of the lampricide 3-trifluoromethyl-4-nitrophenol (TFM) to nymphs of mayflies (*Hexagenia* sp.). C. R. Fremling. 1975. 8 pp.
59. Toxicity and residue dynamics of the lampricide 3-trifluoromethyl-4-nitrophenol (TFM) in aquatic invertebrates. H. O. Sanders and D. F. Walsh. 1975. 9 pp.
60. Toxicity of the lampricide 3-trifluoromethyl-4-nitrophenol (TFM) to nontarget fish in static tests. L. L. Marking and L. E. Olson. 1975. 27 pp.
61. Toxicity of the lampricide 3-trifluoromethyl-4-nitrophenol (TFM) to nontarget fish in flow-through tests. L. L. Marking, T. D. Bills, and J. H. Chandler, Jr. 1975. 9 pp.
62. Toxicity of the lampricide 3-trifluoromethyl-4-nitrophenol (TFM) to selected aquatic invertebrates and frog larvae. J. H. Chandler, Jr., and L. L. Marking. 1975. 7 pp.
63. Laboratory efficacy of 3-trifluoromethyl-4-nitrophenol (TFM) as a lampricide. V. K. Dawson, K. B. Cumming, and P. A. Gilderhus. 1975. 13 pp.
64. Effects of 3-trifluoromethyl-4-nitrophenol (TFM) on developmental stages of the sea lamprey. G. W. Piavis and J. H. Howell. 1975. 8 pp.

65. Accumulation and loss of residues of 3-trifluoromethyl-4-nitrophenol (TFM) in fish muscle tissue: laboratory studies. J. B. Sills and J. L. Allen. 1975. 10 pp.
66. Residues of 3-trifluoromethyl-4-nitrophenol (TFM) in a stream ecosystem after treatment for control of sea lampreys. P. A. Gilderhus, J. B. Sills, and J. L. Allen. 1975. 7 pp.
67. Method for assessment of toxicity or efficacy of mixtures of chemicals. L. L. Marking and V. K. Dawson. 1975. 7 pp.
68. Development and evaluation of on-site toxicity test procedures for fishery investigations. R. M. Burress. 1975. 8 pp.
69. Toxicity of 3-trifluoromethyl-4-nitrophenol (TFM), 2′,5-dichloro-4′-nitrosalicylanilide (Bayer 73), and a 98:2 mixture to fingerlings of seven fish species and to eggs and fry of coho salmon. T. D. Bills and L. L. Marking. 1976. 9 pp.
70. The freshwater mussel (*Anodonta* sp.) as an indicator of environmental levels of 3-trifluoromethyl-4-nitrophenol (TFM). A. W. Maki and H. E. Johnson. 1976. 5 pp.
71. Field tests of isobornyl thiocyanoacetate (Thanite) for live collection of fishes. R. M. Burress, P. A. Gilderhus, and K. B. Cumming. 1976. 13 pp.
72. Toxicity of rotenone to fish in standardized laboratory tests. L. L. Marking and T. D. Bills. 1976. 11 pp.

GPO 843 - 652

(Reports 60 through 62 are in one cover.)

60. Toxicity of the Lampricide 3-Trifluoromethyl-4-nitrophenol (TFM) to Nontarget Fish in Static Tests, by L. L. Marking and L. E. Olson. 1975. 27 pp.
61. Toxicity of the Lampricide 3-Trifluoromethyl-4-nitrophenol (TFM) to Nontarget Fish in Flow-Through Tests, by L. L. Marking, T. D. Bills, and J. H. Chandler. 1975. 9 pp.
62. Toxicity of the Lampricide 3-Trifluoromethyl-4-nitrophenol (TFM) to Selected Aquatic Invertebrates and Frog Larvae, by J. H. Chandler, Jr., and L. L. Marking. 1975. 7 pp.

(Reports 63 through 66 are in one cover.)

63. Laboratory Efficacy of 3-Trifluoromethyl-4-nitrophenol (TFM) as a Lampricide, by V. K. Dawson, K. B. Cumming, and P. A. Gilderhus. 1975. 13 pp.
64. Effects of 3-Trifluoromethyl-4-nitrophenol (TFM) on Developmental Stages of the Sea Lamprey, by G. W. Piavis and J. H. Howell. 1975. 8 pp.
65. Accumulation and Loss of Residues of 3-Trifluoromethyl-4-nitrophenol (TFM) in Fish Muscle Tissue: Laboratory Studies, by J. B. Sills and J. L. Allen. 1975. 10 pp.
66. Residues of 3-Trifluoromethyl-4-nitrophenol (TFM) in a Stream Ecosystem after Treatment for Control of Sea Lampreys, by P. A. Gilderhus, J. B. Sills, and J. L. Allen. 1975. 7 pp.
67. Method for Assessment of Toxicity or Efficacy of Mixtures of Chemicals, by L. L. Marking and V. K. Dawson. 1975. 7 pp.
68. Development and Evaluation of On-site Toxicity Test Procedures for Fishery Investigations, by R. M. Burress. 1975. 8 pp.

(Reports 69 and 70 are in one cover.)

69. Toxicity of 3-trifluoromethyl-4-nitrophenol (TFM), 2′5,-dichloro-4′-nitrosalicylanilide (Bayer 73), and a 98:2 Mixture to Fingerlings of Seven Fish Species and to Eggs and Fry of Coho Salmon, by T. D. Bills and L. L. Marking. 1976. 9 pp.
70. The Freshwater Mussel (*Anodonta* sp.) as an Indicator of Environmental Levels of 3-trifluoromethyl-4-nitrophenol (TFM), by A. W. Maki and H. E. Johnson. 1976. 5 pp.
71. Field Tests of Isobornyl Thiocyanoacetate (Thanite) for Live Collection of Fishes, by R. M. Burress, P. A. Gilderhus, and K. B. Cumming. 1976. 13 pp.
72. Toxicity of Rotenone to Fish in Standardized Laboratory Tests, by L. L. Marking and T. D. Bills. 1976. 11 pp.

(Reports 73 through 76 are in one cover.)

73. Formalin: Its Toxicity to Nontarget Aquatic Organisms, Persistence, and Counteraction, by T. D. Bills, L. L. Marking, and J. H. Chandler, Jr. 1977. 7 pp.
74. Chlorine: Its Toxicity to Fish and Detoxification of Antimycin, by L. L. Marking and T. D. Bills. 1977. 5 pp.
75. Malachite Green: Its Toxicity to Aquatic Organisms, Persistence, and Removal with Activated Carbon, by T. D. Bills, L. L. Marking, and J. H. Chandler, Jr. 1977. 6 pp.
76. Toxicity of Furanace to Fish, Aquatic Invertebrates, and Frog Eggs and Larvae, by L. L. Marking, T. D. Bills, and J. H. Chandler, Jr. 1977. 6 pp.

(Reports 77 through 79 are in one cover.)

77. Efficacy of 3-Trifluoromethyl-4-nitrophenol (TFM), 2′,5-Dichloro-4′-nitrosalicylanilide (Bayer 73), and a 98:2 Mixture as Lampricides in Laboratory Studies, by V. K. Dawson, K. B. Cumming, and P. A. Gilderhus. 1977. 11 pp.
78. Toxicity of the Molluscicide Bayer 73 and Residue Dynamics of Bayer 2353 in Aquatic Invertebrates, by H. O. Sanders. 1977. 7 pp.
79. Accumulation, Elimination, and Biotransformation of the Lampricide 2′,5-Dichloro-4′-nitrosalicylanilide by *Chironomus tentans,* by J. A. Kawatski and A. E. Zittel. 1977. 8 pp.

(Reports 80 and 81 are in one cover.)

80. Effects of Antimycin A and Rotenone on Macrobenthos in Ponds, by L. J. Houf and R. S. Campbell. 1977. 29 pp.
81. Aquatic Macroinvertebrates in a Small Wisconsin Trout Stream Before, During, and Two Years After Treatment with the Fish Toxicant Antimycin, by G. Z. Jacobi and D. J. Degan. 1977. 24 pp.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

FISH CONTROL LABORATORIES
U.S. FISH AND WILDLIFE SERVICE
P.O. BOX 818
LA CROSSE, WISCONSIN 54601

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
INT 423